Appendix YY
Recycled Water

This appendix describes the various aspects of municipal recycled water to support completion of the UWMP recycled water section and tables discussed in Section 5. It provides clarification on how to define and document recycled water in the 2015 UWMPs.

Recycled Water Definition

Municipal recycled water is wastewater that has been treated to a specified quality to enable it to be used again. There are two requirements treated municipal water must meet to be classified as recycled water. It must be reused:

- Beneficially, in a manner consistent with Title 22
- In accordance with a Regional Water Quality Control Board (RWQCB) permit (National Pollutant Discharge Elimination System - NPDES, waste discharge requirement - WDR, water recycling requirement - WRR)

The terms “recycled water” and “reclaimed water” have the same meaning and can be used interchangeably. However, recycled water is used more commonly and it implies a municipal wastewater source. The process by which a facility (industrial or otherwise) uses process water multiple times is usually referred to a internal reuse to distinguish it from municipal recycled water.

Most water that is discharged from a wastewater facility in the state of California can be recycled for some beneficial use. Recycled water encompasses a range of water qualities, depending on the level of treatment provided at the wastewater facility. The distinction between discharged or disposed wastewater effluent and recycled water is the act of the planned beneficial reuse that makes the treated effluent ‘recycled water’. The term “recycled water” is a term indicating a beneficial use after wastewater treatment. It does not indicate a certain level of treatment, such as “tertiary-treatment.”

Recycled water includes wastewater primarily from domestic (household) sources, but it can include commercial, industrial, and institutional (CII) wastewater discharged to a sanitary sewer. Industrial water is considered municipal recycled water when it is comingled with other municipal wastewater or treated by a municipal wastewater treatment facility.

UWMP Recycled Water Narrative

An urban water supplier is to submit one or more paragraphs describing their recycled water program, including participating agencies, treatment plants, distribution system, and uses. Please provide either a map of the distribution system or a physical description.

Levels of Treatment

Municipal wastewater that can be beneficially reused is classified by its level of treatment. Title 22 identifies those levels of treatment and the potential uses. Primary-treated water, that which has removed 70 to 85 percent of the organic and inorganic solids through either settling or floating, is not able to be recycled in California. When reporting level of treatment in Tables __ and __, one of the the following five treatment catagories are to be used:

- Secondary, Undisinfected mixes the remaining suspended waste solids with microorganisms and air. The micro-organisms convert the waste solids to biomass that settles out.
- Secondary, Disenfected-2.2 text
- Secondary, Disinfected-23 text
- Tertiary Treatment filters out most of the remaining solids through a granular media (sand or anthracite coal) or a membrane, with the final product water being disinfected with chlorine or ultraviolet light to kill off bacteria, viruses, and other microorganisms.
- Advanced Treatment is any water treatment technologies beyond conventional coagulation, filtration and disinfection. These may include reverse osmosis, micro- or nanofiltration, ozonation, or advanced oxidation.

The levels of treatment are mostly governed by Title 22 requirements to protect public health.

A key component of incorporating municipal recycled water into CII applications is aligning potential uses to the availability of various levels of treated municipal recycled water. Determining municipal recycled water availability requires coordination with both the local water and wastewater agencies, because each jurisdiction has its own roles, authorities, and service areas with respect to municipal recycled water generation and distribution.

Table 9.2 summarizes CII applications allowed for levels of municipal recycled water treatment specified in Title 22. While Title 22 lists specific allowed uses, other uses are permitted on a case-by-case evaluation and approval by CDPH. For example, additional non-potable recycled water applications include geothermal power production and carpet-dying. In general, the linkage between level of recycled water treatment and potential uses specified in Title 22 is strongly influenced by the potential for direct human contact and ingestion, with higher levels of treatment (tertiary or advanced) required for open public access and worker contact issues.

Indirect potable reuse through groundwater recharge has occurred in California since 1962. Title 22 does not specify specific treatment, design, or monitoring requirements for groundwater recharge although they are included in the Draft Regulations for Groundwater Replenishment with Recycled Water, currently being revised by the CDPH. Current regulations provide that CDPH will make recommendations to the RWQCBs for each project on a case-by-case basis. The recommendations are reflected in the requirements of water recycling permits issued by the RWQCBs. To provide a more systematic approach to regulating groundwater recharge, CDPH

drafted regulations in the 1980s. The draft regulations were based in part on recommendations by the Scientific Advisory Panel on Groundwater Recharge and an earlier scientific panel. These draft regulations have evolved as new research and data from existing projects have become available.

Title 22

Title 22, the regulation overseeing reuse or "recycling" of municipal wastewater, uses level of treatment and bacteriological water quality standards to define what uses are legally allowed, based on the probability of public contact. Title 22 defines uses for water ranging from water that has had secondary wastewater treatment that is not disinfected to water that has undergone advanced treatment.

Title 22, the regulation overseeing reuse or "recycling" of municipal wastewater,

The Division of Drinking Water (DDW) prescribes the levels of treatment required for municipal recycled water to protect public health. The levels of treatment are based on the levels of human exposure and the types of exposure that provide pathways to infection. The required levels of treatment are specified in Title 22 of the California Code of Regulations (Division 4, Chapter 3, §60301 et seq.). Title 22 regulations also specify monitoring and reporting requirements and onsite use area requirements

Discharge Versus Recycling

Text

Planned Versus Unplanned

Treated municipal wastewater is integrated into California's water supply through both unplanned applications, such as discharge into a stream with a subsequent reuse, or through planned projects. Unplanned reuse occurs when treated wastewater is discharged — usually into a surface water body — and there is no prearranged agreement or intention that the producer would maintain control of the effluent. Discharged treated wastewater supplements river flow and can be a downstream benefit for wetland or aquatic habitat, or withdrawn by a downstream river water user. In the case of the latter, the wastewater discharge is regulated to protect the public health for the downstream beneficial user (Recycled Water Task Force 2003).

Planned recycled water projects are developed by water and wastewater suppliers for potable and non-potable uses (Figure 12-2). Non-potable recycling includes any application not involving drinking water for human consumption, such as landscape or agricultural irrigation, commercial applications like car washes or dual-plumbed office buildings, or industrial process such as oil refineries or cooling towers. Potable reuse results in augmentation to drinking water supplies, and it can be either direct or indirect.

Direct Versus Indirect

Direct potable reuse is treated water conveyed directly from the wastewater treatment plant to a raw or treated drinking water supply lines, a practice which is not currently occurring in California. Indirect potable reuse is treated water from the wastewater treatment plant discharged into recharge basins to infiltrate into groundwater aquifers or into surface water reservoirs used for drinking water supply. Because seawater intrusion barriers typically result in groundwater recharge, they are considered a form of indirect potable reuse.

Water discharged from a wastewater facility may still be reused even if it is not a planned action, downstream entity withdraws water from the stream, a portion of that water is treated wastewater from an upstream discharge that has commingled with the ambient stream flow. Typically, treated wastewater is discharged into rivers and streams as part of permitted disposal practices. Discharged water then commingles with the stream or river that may be a water source for downstream communities or agricultural users.

Quantifying recycled water production and use within the area considered by the UWMP

Text

Involved Agencies

Text

Wholesaler vs retailer

Text

Internal Reuse

Text

Beneficial Uses

Title 22 uses level of treatment and bacteriological water quality standards to define what uses are legally allowed, based on the probability of public contact. Title 22 defines uses for water ranging from water that has had secondary wastewater treatment, but is not disinfected, to water that has undergone advanced treatment (see Figure __-1).

The beneficial use must be part of a permit issued by a RWQCB for waste discharge or water recycling and must be consistent with that permit.

Recycled water does not have to offset potable demand to be considered beneficially reused.

The reclamation and reuse of wastewater for beneficial use that is used to offset potable demand, including recycled water supplied for direct use and indirect potable reuse,

Agricultural Irrigation

Text

Landscape Irrigation

Text

Golf Course Irrigation

Text

Commercial

Text

Industrial

Text

Geothermal Energy Production

Text

Seawater Intrusion Barrier

Text

Groundwater Recharge

For groundwater recharge, including recharge through spreading basins, water supplies that are all of the following:

1. Metered.
2. Developed through planned investment by the urban water supplier or a wastewater treatment agency.
3. Treated to a minimum tertiary level.

4. Delivered within the service area of an urban retail water supplier or its urban wholesale water supplier that helps an urban retail water supplier meet its urban water use target.

Only groundwater recharge projects that are permitted by the state can use groundwater recharge as a beneficial use. A water agency cannot claim to be beneficially recharging groundwater as a result of pond leakage.

Recreational Impoundment

Text

Natural Systems/Restoration

Text

Surface Water Augmentation

For reservoir augmentation, water supplies that meet the criteria of paragraph (1) and are conveyed through a distribution system constructed specifically for recycled water. (CWC §10608.12(m))

Indirect Potable Resuse

Text

Other

Text

Coordination of UWMP and the 2015 Recycled Water Survey Data

The SWRCB and DWR are conducting a statewide survey of all statewide municipal recycled beneficial use for the 2015 calendar year, with the intent that data provided in the UWMPs will be directly applied to the survey data. This single collection of data for dual purposes should streamline the survey process and support consistent data reporting. For some recycled water users, the survey will be more comprehensive than the data reported in the UWMPs – for example, requesting information on the types of crops irrigated with recycled water – and will follow-up data requesting will be needed.

Coordinating with other agencies and counting the recycling for the UWMP organization and how to handle recycled water used in your service area but not provided by you.

Section A:
Glossary

Public agency

Any board, commission, county, city and county, city, regional agency, district, or other public entity. (CWC §10616)

Recycled water

Water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefor [sic] considered a valuable resource" (CWC Section 13050(n)).